Accounting Information and Equity Valuation

Theory, evidence, and applications

Guochang Zhang *
Hong Kong University of Science and Technology

2013

Manuscript prepared
for Springer (Springer Series in Accounting Scholarship)

_____

* Correspondence: Department of Accounting, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong SAR. (852) 2358 7569; acgzhang@ust.hk

Chapter 11. Fair Value Accounting and Income Measurement:
An Application to Standard Setting

In this chapter, we employ the ROM (real options model) framework outlined in previous chapters to address the relevance of fair value accounting for equity valuation purposes. In recent times, companies worldwide are increasingly required to adopt fair value measurement for financial reporting, moving gradually away from the historical cost convention. This shift is widely believed to have important ramifications for both firms and user groups, but its exact impact is not yet well understood. By extending the ROM developed in previous chapters, we explore here how, and to what extent, fair value measures help to convey an enterprise's income generation in a way that is pertinent to equity investors.

More specifically, we adopt here a "financial analysis" perspective to investigate the usefulness of fair value accounting for conveying valuation-relevant information, given the economic activities undertaken by the firm. This position is consistent with the expressed objective of financial reporting (for example, the FASB SFAC5) of facilitating valuation by investors and other users.[1] This line of research has potential for informing standard setters on issues such as the scope for adopting fair value measurement within financial statements and how to define and measure an enterprise's performance.

11.1 Motivation

The US FASB began to make significant moves towards fair value accounting in the 1990s with the releases of such standards as SFAS 115 (for investment securities) and SFAS 133 (for derivative securities), aimed to make financial statement information more closely reflect *current* economic transactions. To date, a series of fair value standards have been issued by the FASB and the International Accounting Standard Board (IASB) for selected assets and liabilities, and the scope of adaptation is likely to be further broadened. As countries around the world strive to converge their respective GAAP standards with the IFRS, a global trend is underway to embrace the expanded use of fair value accounting.

Despite its intuitive appeal, however, fair value accounting remains controversial, not only because in many instances such measures are not readily observable (and so need to be

---

[1] Issues related to debt and executive contracting are outside of the scope of this discussion. Also, we do not adopt a "general-equilibrium" approach to probing the effect of fair value accounting on firms' real decisions and on economy-wide resource allocation that operates through the information set which firms face. We implicitly maintain that when investors receive more relevant information about a firm's operations, prices will be more informationally efficient, and this in turn will improve resource allocation.

subjectively estimated) but more fundamentally because the conceptual basis for using fair value (as opposed to historical cost) is yet to be firmly established. Thus far, much of the debate has centered on whether fair value measures are reliable and whether managers can misuse the rules for personal gains (see, for example, Barth, 2004 and Benston, 2008 for views both for and against fair value accounting). However, there is still very little theoretical research demonstrating the usefulness (or lack thereof) of fair value accounting for the purposes of investor valuation.[2]

Meanwhile, there is clearly demand in standard setting circles for conceptual research that can potentially guide the formulation of reporting standards. To give an example, in the joint work of the IASB and the FASB on the Financial Performance Reporting Project (FPR) which started in 2004, both conceptual and presentational issues pertaining to performance reporting have been raised and discussed, many of which either directly concern fair value measures or are intertwined with them. They include, among others, the meaning of income (IASB/FASB, 2005a), the distinction between net income (NI) and other comprehensive income (OCI) (IASB/FASB, 2005a), whether it is a good idea to separately present fair value changes (remeasurements) from other income and expenses (IASB/FASB, 2005b), and what criteria/characteristics should be used when determining whether a transaction or item should be included in NI versus OCI (IASB/FASB, 2005b). This last point concerns a long list of items such as unrealized gains and losses in available for sale (AFS) securities, gains and losses from foreign currency translation adjustments, revaluation of property, plant and equipment (PP&E), pension liability adjustments, and so on.

In the absence of a considered theoretical framework, individuals tend to make subjective judgments from their own vantage points based on their own unique experiences. Presently, views on the above-mentioned and other issues related to fair value accounting often diverge among standard setters, and practices differ across individual jurisdictions. To shed theoretical light on these debates and discussions, it will be useful to develop a rigorous model that can explain how and why fair value information is relevant to investors. This chapter makes an initial attempt towards this aim.

11.2 Economic setting and equity valuation

The valuation problems examined in previous chapters have typically been simplified, with firms conducting only "operating" activities. To make the topic of fair value accounting

---

[2] Indeed, as Lambert (2010, p. 294) observes, there is a lack of theoretical research into the valuation role of accounting in general. In contrast, several studies have explored the desirability of fair value accounting in resolving issues related to debt financing (see for example Bleck and Gao, 2010; Lu, Spra, and Subramanian, 2011).

nontrivial, we extend such basic settings along two dimensions. Firstly, we assume that a firm conducts "financial" as well as operating activities (as in Feltham and Ohlson 1995). Financial activities are of a *trading* nature whereby the firm acquires assets and holds them passively for subsequent resale. Financial activities correspond to the exchange sector of an economy, and in performing them the firm's role is merely one of a trader. In contrast, in conducting operating activities, the firm uses (and typically consumes) assets as an input to producing the final product. Operating activities correspond to the real sector of the economy, which most directly contributes to wealth creation.[3]

Secondly, we assume that both financial and operating assets are traded in their respective markets, and their prices fluctuate over time in ways exogenous to the firm. The scope of the analysis is limited to the financial reporting aspects of a firm, and we treat as given the firm's economic activities and the external environment (in particular, the market conditions) facing the firm. For simplicity, the firm is assumed to be fully equity financed. In the analysis below, we take period t+1 (starting from date t) as a representative period for measuring firm performance.

Let P_t^f be the combined market price of the firm's financial assets held at date t. At date t+1, the price of these same assets changes to $P_{t+1,existing}^f$. During period t+1, the firm receives interest FX_{t+1} on its financial assets (paid at the end of the period).

The set of financial assets held by the firm at date t+1 generally differs from that at date t owing to transfers between financial and operating activities, on the one hand, and transactions with the firm's investors on the other. We denote P_{t+1}^f as the combined market price of the financial assets held at date t+1.

The firm's operating assets have a total market price of P_t^o at date t. During period t+1, the price index of operating assets changes by θ_{t+1} (in proportional terms). This means that the same set of operating assets at date t would have a market price of $(1+\theta_{t+1})P_t^o$ at date t+1. To keep the exposition simple, we assume that the firm employs a single operating asset (this can be interpreted as the mixture of the different individual assets actually used).

The firm generates cash flow cr_{t+1} from its operating activities in period t+1. However, during this process of operation, wear and tear causes the productive capacity of the asset to

---

[3] The terms "financial" and "operating" here identify activities or assets based on the firm's intended business purposes, and their meanings do not necessarily coincide with the conventional use of these terms. For example, a financial asset here can be a security or a physical asset such as land. We consider the two types of activities in their "pure" form in order to highlight their different implications for accounting. In more general settings, the boundary separating the two classes of activities can sometimes be blurred as the firm may potentially switch from one intention to the other when circumstances change. Research into this type of mixed scenario is a topic for the future.

decline, which results in (true) economic depreciation. Let AS_t be the level of (operating) asset stock at date t, $Edep_{t+1}$ the economic depreciation in period t+1 (that is, the decline in asset stock), and ci_{t+1} the cash investment made at date t+1 to replenish the asset stock. (Here, asset stock is synonymous with the productive capacity of the asset.)

Without loss of generality, we express asset stocks at all dates in terms of the constant price of date t. Then, $AS_t = P_t^o$, and

$$AS_{t+1} = AS_t - Edep_{t+1} + ci_{t+1}/(1+\theta_{t+1}).$$ (11-1)

In Equation (11-1), the cash investment at date t+1 needs to be "discounted" when it is converted into asset stock (as measured at the date t price) because of the change in asset price.

By definition, the firm's operating asset at date t+1 has a market price of $P_{t+1}^o = (1+\theta_{t+1})AS_{t+1}$. Applying Equation (11-1), we get

$$P_{t+1}^o = (1+\theta_{t+1})(AS_t - Edep_{t+1}) + ci_{t+1} = (1+\theta_{t+1})(P_t^o - Edep_{t+1}) + ci_{t+1}.$$ (11-2)

Following Chapter 4, we define $OX_{t+1}^E \equiv cr_{t+1} - Edep_{t+1}$ as the "economic earnings" in period t+1 generated from operating activities, and $q_{t+1} \equiv OX_{t+1}^E / AS_t$ as the corresponding "economic profitability,"[4] which measures the firm's efficiency in using assets to generate value.

As for the original ROM set out in Chapter 4, we assume that profitability follows a random walk (implying that business fundamentals tend to persist from one period to the next), and that the firm has the flexibility to adjust the course of its operations by either exercising the abandonment option when profitability falls to a sufficiently low level or exercising the growth option when it climbs sufficiently high. Then, the value at date t of the firm's operating activities (V_t^o) is determined in the same way as in Chapter 4, which is

$$V_t^o = E_t(O\widetilde{X}_{t+1}^E)/r + AS_t[P(q_t) + gC(q_t)] = AS_t[q_t/r + P(q_t) + gC(q_t)].$$ (11-3)

In Equation (11-3), $E_t(O\widetilde{X}_{t+1}^E)/r$ is the baseline value in a steady-state operation, whereas $P(\cdot)$ and $C(\cdot)$ are, respectively, the abandonment and growth options, both of which are normalized by asset stock (AS_t). The option values depend on the distribution of profitability in period t+1, given current profitability (q_t). Parameter g is the firm's growth potential, defined as the percentage by which the scale of invested capital may grow.

---

[4] As explained in Chapter 4, "economic earnings" means what accounting earnings would be under the (ideal) condition of unbiased depreciation. Correspondingly, the economic profitability of operating assets, q_{t+1}, is equivalent to the internal rate of return on operating assets.

It is important to distinguish between the intrinsic value of operating activities and the market value of the operating *asset* (which is an input for operating activities). The former is the value derived from a business operation, and is determined on the basis of the expected cash flows it generates (through making and selling the firm's products), whereas the latter represents the cost of one of the input factors for the operation (such as equipment and buildings) and must be used in combination with other necessary factors such as raw materials and labor. Equating the two notions of value would amount to ignoring the role of other factors such as human resource that are necessary for organizing and carrying out business activities (which would also render valuation a trivial task). Furthermore, since the ability of the management to employ capital resource efficiently is firm-specific – as some managers are competent and others less so – there is no fixed relation between firm value and operating assets that is applicable to all firms. As in the ROM, investors need to determine this relation based on a firm's specific efficiency (q_t) and growth environment (g).

The firm's value is the sum of the value it generates from financial activities (which equals the value of financial assets given that they are held for trading purposes only) and the value of operating *activities* (which is distinct from the market price of operating assets):

$$V_t = V_t^f + V_t^o = P_t^f + AS_t[q_t/r + P(q_t) + gC(q_t)]. \tag{11-4}$$

Note that value additivity for the two types of activities follows from value being defined as the present value of expected future cash flows.

Equation (11-4) shows that firm value depends on the following attributes of the firm's economic activities: the market value of financial assets (P_t^f), operating asset stock (AS_t) and profitability (q_t). To compute the return over period t+1, we take changes in Equation (11-4) with respect to these attributes:

$$V_{t+1} - V_t = (P_{t+1}^f - P_t^f) + v \times (AS_{t+1} - AS_t) + AS_t v'(.)(q_{t+1} - q_t), \tag{11-5}$$

where $v \equiv q_t/r + P(q_t) + gC(q_t)$, and $v'(.) \equiv dv/dq_t = 1/r + P'(.) + gC'(.)$.

The stock return over the period is

$$R_{t+1} \equiv \frac{V_{t+1} - V_t + d_{t+1}}{V_t}$$

$$= \frac{P_{t+1}^f - P_t^f + d_{t+1}}{V_t} + v\frac{1}{V_t}(AS_{t+1} - AS_t) + v'\frac{AS_t}{V_t}(q_{t+1} - q_t). \tag{11-6}$$

Maintaining the financial asset account implies

$$P_{t+1}^f = P_{t+1,existing}^f + FX_{t+1} + cr_{t+1} - ci_{t+1} - d_{t+1}. \tag{11-7}$$

Denote $\Delta P_{t,existing}^f \equiv P_{t+1,existing}^f - P_t^f$ as the capital gain on the financial assets held in period t+1. We have

$$P_{t+1}^f - P_t^f + d_{t+1} = [P_{t+1,existing}^f - P_t^f] + FX_{t+1} + cr_{t+1} - ci_{t+1}$$

$$= \Delta P_{t,existing}^f + (FX_{t+1} + OX_{t+1}^E) - (ci_{t+1} - Edep_{t+1}). \qquad (11\text{-}8)$$

Rewrite Equation (11-1) as $ci_{t+1} - Edep_{t+1} = (AS_{t+1} - AS_t)(1 + \theta_{t+1}) + \theta_{t+1} Edep_{t+1}$. Then, Equation (11-6) becomes

$$R_{t+1} = \frac{1}{V_t} \left\{ \Delta P_{t,existing}^f + (FX_{t+1} + OX_{t+1}^E) - \theta_{t+1} Edep_{t+1} \right\}$$

$$+ \frac{1}{V_t} \left\{ v' AS_t \, (q_{t+1} - q_t) + [v - (1 + \theta_{t+1})](AS_{t+1} - AS_t) \right\}. \qquad (11\text{-}9)$$

In Equation (11-9), the equity return over period t+1 arises from two principal sources. The first is the value generated (both realized and readily realizable) over period t+1 from both financial and operating activities, which totals $\Delta P_{t,existing}^f + FX_{t+1} + OX_{t+1}^E$. The second is the change in expected future value generation from operating activities, which is caused by the change in profitability ($q_{t+1} - q_t$) and in asset stock ($AS_{t+1} - AS_t$). In addition, the equity return is also affected by the change in the price index of operating assets (θ_{t+1}) because that affects the amount of cash investment required to both replenish the depreciated asset stock and build up the stock level.

11.3 Accounting representation of equity value and return

We assume the following accounting rules for measuring economic activities. Firstly, both financial and operating assets are measured at fair (market) value. Thus, at any given date τ, $FA_\tau = P_\tau^f$ and $OA_\tau = P_\tau^o$, where FA_τ and OA_τ denote the book values of operating and financial assets at date τ, respectively.[5]

Secondly, a conservative depreciation policy is adopted. Let dep_τ be the accounting deprecation for period τ. Then, the bias in depreciation recognition for period τ is $u_\tau \equiv dep_\tau - Edep_\tau$. A conservative policy suggests that the cumulative bias in recognized

---

[5] A similar valuation model can also be derived by (alternatively) assuming historical cost-based accounting for operating assets. While the mathematical expression of that model would be somewhat different, it has the same implications for income measurement and performance reporting.

depreciation over time is nonnegative. In the special case where the depreciation policy is unbiased, we have $dep_\tau = Edep_\tau$, and hence $u_\tau = 0$, $\forall \tau$.

It is worth clarifying that adopting a conservative depreciation policy to compute operating income does not contradict fair value accounting for operating assets. The former affects the measurement of operating income whereas the latter determines the total change in asset value; any discrepancy can be reconciled by an additional item that may either be included in the income statement or bypasses the statement to be entered directly into the equity account.

Thirdly, earnings from operating activities are defined as $OX_\tau \equiv cr_\tau - dep_\tau$. In the case of unbiased depreciation, accounting earnings coincide with economic earnings (see Chapter 4).

Finally, the book value of equity at date τ (B_τ) is the sum of the book values of financial assets and operating assets: $B_\tau = FA_\tau + OA_\tau$.

Once the accounting rules have been specified, we can represent the (economic) attributes of business operations by accounting measures of "stocks" and "flows."[6] With asset stock stated at the date t price level, we have $OA_t = P_t^o (= AS_t)$ and

$$OA_{t+1} = P_{t+1}^o = (1+\theta_{t+1})AS_{t+1} = (1+\theta_{t+1})(P_t^o - Edep_{t+1}) + ci_{t+1}. \tag{11-10}$$

It follows that the change in asset stock over period t+1 can be expressed as $AS_{t+1} - AS_t =$

$\dfrac{OA_{t+1}}{1+\theta_{t+1}} - OA_t = (OA_{t+1} - OA_t) - \theta_{t+1}AS_{t+1}$. Employing Equation (11-1) and denoting

$w_{t+1} \equiv \theta_{t+1}(OA_t - Edep_{t+1})$ (which is the price change of the firm's operating assets in period t+1, net of economic depreciation), we get

$$AS_{t+1} - AS_t = (OA_{t+1} - OA_t) - w_{t+1} - \frac{\theta_{t+1}}{1+\theta_{t+1}}ci_{t+1}. \tag{11-11}$$

Thus, the change in asset stock over period t+1 is approximated by the change in asset book value, with a discrepancy caused by the fluctuation in asset price.

Economic earnings generated from operating activities are measured by accounting earnings with a bias,

$$OX_{t+1}^E = OX_{t+1} + u_{t+1}. \tag{11-12}$$

The accounting profitability of operating activities for period t+1 is defined as $ROA_{t+1} \equiv OX_{t+1}/OA_t$. It measures economic profitability (q_{t+1}) with a bias,

$$ROA_{t+1} = \frac{OX_{t+1}}{OA_t} = \frac{OX_{t+1}^E - u_{t+1}}{AS_t} = q_{t+1} - \frac{u_{t+1}}{AS_t}. \tag{11-13}$$

---

[6] If we alternatively assume historical cost-based accounting (instead of fair value accounting) for operating assets, the relations between the accounting and economic variables will be similar, except for the measurement bias terms.

The return model specified in Equation (11-9) also depends on the prior period's profitability ($q_t \equiv OX_t^E / AS_{t-1}$), which is derived from the prior period's operating income and beginning asset stock. Since, by definition, $OA_{t-1} = P_{t-1}^o = AS_{t-1}/(1+\theta_t)$, where θ_t is the change in period t of the price index of operating assets, the accounting profitability for period t can be expressed as

$$ROA_t \equiv \frac{OX_t}{OA_{t-1}} = \frac{OX_t^E - u_t}{AS_{t-1}/(1+\theta_t)} = (q_t - \frac{u_t}{AS_{t-1}})(1+\theta_t). \tag{11-14}$$

It follows from Equations (11-13) and (11-14) that

$$q_{t+1} - q_t = (ROA_{t+1} - ROA_t) + \frac{\theta_t}{1+\theta_t}ROA_t + (\frac{u_{t+1}}{AS_t} - \frac{u_t}{AS_{t-1}}). \tag{11-15}$$

That is, the change in economic profitability is approximated by the change in accounting profitability, with the discrepancy caused by (i) the price change of operating assets and (ii) biased depreciation recognition.

The total comprehensive income for period t+1 (TCI_{t+1}) is defined as the total change in assets and liabilities (excluding those arising from equity transactions with investors); that is,

$$TCI_{t+1} \equiv B_{t+1} - B_t + d_{t+1} = (P_{t+1}^f + P_{t+1}^o) - (P_t^f + P_t^o) + d_{t+1}. \tag{11-16}$$

Employing the financial asset relation in Equation (11-7) and simplifying, we get

$$TCI_{t+1} = \Delta P_{t,existing}^f + FX_{t+1} + OX_{t+1} + u_{t+1} + \theta_{t+1}(OA_t - Edep_{t+1}). \tag{11-17}$$

Thus, total comprehensive income is equal to the sum of the interest income on financial assets (FX_{t+1}), earnings from operating activities (OX_{t+1}), and gains or losses resulting from the remeasurement of both financial and operating assets ($\Delta P_{t,existing}^f + \theta_{t+1}(OA_t - Edep_{t+})$), with an adjustment for accounting bias u_{t+1}.

Based on the above assumptions and derivations, we can represent the original return function in Equation (11-9) in accounting terms as

$$R_{t+1} = \frac{1}{V_t}\{\Delta P_{t,existing}^f + FX_{t+1} + OX_{t+1} + u_{t+1} - \theta_{t+1}Edep_{t+1}\}$$

$$+ \frac{1}{V_t}\{v'OA_t(ROA_{t+1} - ROA_t) + [v - (1+\theta_{t+1})][(OA_{t+1} - OA_t) + \beta]\}, \tag{11-18}$$

where $\alpha \equiv \frac{\theta_t}{1+\theta_t}ROA_t + (\frac{u_{t+1}}{AS_t} - \frac{u_t}{AS_{t-1}})$ and $\beta \equiv -w_{t+1} - \frac{\theta_{t+1}}{1+\theta_{t+1}}ci_{t+1}$ are adjustments required owing to changes in operating asset prices and accounting biases.

In Equation (11-18), the equity return over a time period has two distinct components. The first (enclosed in the first pair of curly brackets) is the value generated from economic activities over the *contemporaneous* period. From financial activities, the firm generates value in the form of capital gains, $\Delta P_{t,existing}^{f}$, and interest income, FX_{t+1}, and from operating activities it generates value in the form of earnings, OX_{t+1}. To identify the true amount of value being generated, investors also need to adjust for both conservative depreciation (u_{t+1}) and the price change of operating assets (which affects the cash investment required to refill the depreciated asset stock, $\theta_{t+1}Edep_{t+1}$).

On the other hand, the second return component (the expression in the second pair of curly brackets) represents changes in expected *future* value generation, which is caused by the change in profitability ($ROA_{t+1} - ROA_t$) and the change in operating assets ($OA_{t+1} - OA_t$). To determine this second component, investors need to compare operations in the current period with those of the period before, which requires information derived from the comparative balance sheets and income statements for the two periods.

11.4 Implications for the role of fair value accounting

On the basis of the return model in Equation (11-18), we infer the relevance of fair value accounting to equity investors and identify its implications for other, related issues such as how accounting income should be defined for valuation purposes and what criteria should be applied to determine other comprehensive income.[7] The point we highlight is that in addressing these and other related reporting issues, one should draw a distinction between financial and operating activities, because of the differential economic roles of both the firm and the assets employed in each type of activities.

11.4.1 Relevance of fair value accounting for financial and operating activities

The model shown in Equation (11-18) indicates that fair value gains or losses on financial assets are part of the value generated over the reporting period; they affect returns in the same way as other sources of income such as earnings from operations because they directly add wealth to investors. In contrast, gains or losses on operating assets are not equivalent to value generation for investors, and in general it is not immediately clear how they affect investors' wealth. This means

---

[7] Parts of the discussion below overlap somewhat in substance, but the specific issues addressed have been separately raised and deliberated on by standard setters.

that fair value accounting for financial (trading) assets yields information that is directly relevant to equity investors, whereas the usefulness of fair value accounting for operating assets is unclear. Here, the relevance of fair value gains or losses is not predicated on the *realization principle*, that is, whether or not these gains or losses have indeed been realized (the implicit assumption here is that assets are not systematically mispriced in markets).

The differential valuation relevance of gains or losses with respect to financial and operating assets is a result of the different economic roles played by these assets in the firm's value generation activities. Financial assets are held passively for trading purposes, and the firm as a business entity acts merely as an investor. From the firm's standpoint *as an investor*, gains or losses on these assets directly translate to changes in firm value (and hence investor wealth). In this sense, they are equivalent to value generated (or lost).

In contrast, operating assets serve as an input factor for producing the firm's final product. They are used in the process of value generation, and their usefulness to the firm lies in their capacity to produce a final product, rather than resale. Insofar as the firm remains a going concern, fair value changes for operating assets are neither value generation nor do they affect the productive capacity of these assets.[8] In this sense, the well-being of investors is not necessarily increased by fair value gains or reduced by losses on operating assets.[9]

The differential usefulness of fair value accounting for financial and operating assets has implications for standard setting organizations, which have been advocating expanded use of fair value accounting but have not yet decided how far this should go; in other words, they are undecided about whether this measurement approach should be applied to all assets and liabilities on the balance sheet or a subset of these items and, if the latter, which ones. As Barth (2006a, p. 98) observes, "in almost every standard-setting project of the FASB and IASB, the boards consider fair value as a possible measurement attribute."[10] The model delineated above suggests that standard setters should distinguish between assets that play dissimilar economic roles in value generation, and that the uniform adoption of fair value accounting across all items on the balance sheet does not serve the information needs of investors well.

11.4.2 Implications for income measurement

---

[8] One exception is the situation when existing operating assets are disposed of, but in this case such assets have ceased to be "operating" for the firm concerned.

[9] Consistent with this theoretical result, Christensen and Nikolaev (2009) report that they find no evidence indicating that investors demand fair value accounting for nonfinancial assets. Dichev (2008) and Nissan and Penman (2007) also argue for the differential treatment of financial and operating assets, but do not develop a formal valuation model to support their arguments.

[10] See also Johnson (2005) and Schipper (2005).

Conceptually, what constitutes accounting income is still subject to debate among standard setters and academics. In this subsection, we explain how accounting income should be defined on the basis of the above specified return model. We go on to use this definition to evaluate the existing income measures adopted in various accounting jurisdictions and those being actively considered by standard setting bodies.

11.4.2a Definition of income

Following the above model, a natural definition of income for valuation purposes is the value generated by the business entity over a time period. This definition grants income an unequivocal *economic* interpretation, and is compatible with the discounted cash-flow framework (which underpins the above return model). However, because of conservative accounting and changing asset prices, the accounting system provides a distorted measure of this theoretical construct, so users must adjust the reported accounting data.

In the above model, "value generated" makes up a portion of equity return. This portion is distinctly different from "changes in expected *future* value generation", in terms of whether the underlying economic activities have already been conducted and, correspondingly, whether operational data have become observable.

11.4.2b Evaluation of some existing and potential income measures

It is noteworthy that the income measures adopted in prevailing GAAPs and those under consideration by standard setting bodies do not fully conform to the above definition, although, for the most part, they overlap with it. Below, we evaluate some of these measures in relation to the above definition.

Income measures reported under existing GAAPs. Generally speaking, the income measures adopted by existing GAAPs deviate from the notion of value generated either because they exclude some items that constitute value (wealth) for investors or include some items that do not. As such, their economic meaning is not unequivocally clear (at least from a valuation perspective). For example, the net income amount reported under the US GAAP excludes some items that constitute value generation, such as unrealized gains or losses on financial instruments in the categories of available-for-sale and held-to-maturity; these items are instead reported as other comprehensive income (FAS 115). On the other hand, the summary measure under the IFRS includes both losses and, under certain circumstances, gains arising from revalued property, plant, and equipment (IAS 39 and IAS 16), which are not (economic) value generated from an investor standpoint.

Total comprehensive income. Total comprehensive income is the total change in (recognized) assets and liabilities over a period excluding those arising from transactions with the firm's owners. This measure stems from the "enterprise approach" to income recognition, which would include all

accounting gains or losses within the scope of the enterprise (IASB/FASB, 2005b), and is advocated by the IASB (Barth 2006b). This measure is rooted in Hicks' (1946) notion of income, but has been adapted to the practical context (where the balance sheet does not recognize all expected future gains).

In the above model, total comprehensive income is given by the expression $[\Delta P^f_{t,existing} + FX_{t+1} + OX_{t+1} + u_{t+1} + \theta_{t+1}(OA_t - Edep_{t+1})]$. Because of its all-inclusiveness, total comprehensive income encompasses both value-generated items ($\Delta P^f_{t,existing} + FX_{t+1} + OX_{t+1}$) and non-value-generated items such as changes in the market value of operating assets ($\Delta\theta_{t+1}(OA_t - Edep_{t+1})$).[11] As such, this measure lacks a clear economic interpretation and does not effectively or clearly convey what investors need to know.

Other measures of income under consideration. During the deliberations of the IASB/FASB's joint project on financial statement presentation, four alternative illustrative formats were presented for the statement of comprehensive income (IASB/FASB, 2007); however, none of them contains a subtotal or summary measure that fully conforms to the notion of value generated. The formats under Alternatives 1 and 2 provide a subtotal called "total operating income," which is a partial account of value generation, excluding, for example, gains or losses on financial assets. The format under Alternative 3 provides a subtotal called "total short-term income before tax," which again is a partial account of value generation, excluding, for example, gains or losses on available-for-sale securities. More strikingly, the format under Alternative 4, which represents the IASB/FASB's long-term goal to eliminate the category of OCI, provides a subtotal called "comprehensive operating income" that is even less clear in terms of economic meaning: not only does it exclude some value-generated items (such as gains or losses on financial assets), it is also contaminated by non-value-generated items (such as gains on revaluation of fixed assets). Finally, all four alternative formats report "total comprehensive income" as the summary measure, which mixes value-generated items with non-value-generated items. The above theoretical model suggests that none of these illustrative formats effectively serves the needs of equity investors by reporting the total comprehensive income and the subtotals.

11.4.3 Boundary between income and OCI

As discussed, the summary income measures under existing GAAPs (such as NI in the US GAAP) lack a clear theoretical foundation, and the economic basis for the separation between NI (or

---

[11] In situations where a firm involves foreign operations, gains or losses resulting from foreign currency translation adjustments are also not value generation.

an equivalent construct) and OCI has not been made clear. Furthermore, inconsistencies exist among the summary measures adopted in different jurisdictions. The notion of value generated arising from the above model serves a theoretical anchor for accounting income, which sets a well-defined boundary between income and OCI. The theoretical underpinnings help standard setters to resolve the long-standing issue of which accounting gains or losses should be included in, and which should be excluded from, the concept of summary income (and why) (IASB/FASB, 2005a).

By defining what income is, we also define its complement, namely OCI. In the context of the above model, OCI should be defined as the collection of those changes in assets and liabilities during the reporting period (other than those resulting from equity transactions) that do not generate value for investors.

Moving beyond the simplified setting for the above model, items that are value generated and hence should be recognized as income further include (i) unrealized gains or losses on trading securities, available-for-sale securities, and held-to-maturity securities; (ii) gains or losses resulting from cash flow or foreign currency hedges; (iii) pension liability adjustments; and (iv) impairments of operating assets arising from loss (damage) of physical productive capacity.

Items that do not contribute to value generation and thus should not be recognized as income include (i) gains or losses on PP&E used for operating activities that arise from changes in market prices; (ii) gains or losses from foreign currency translation adjustments on net investments; and (iii) adjustments arising from accounting policy changes.

11.5 Summary

In this chapter, we examine theoretically the relevance of fair value accounting to income measurement from the standpoint of equity investors and identify implications for other financial reporting issues. We show that fair value accounting for financial assets facilitates valuation because it conveys value generation over the reporting period, whereas fair value accounting for operating activities serves no clear purpose. This differential usefulness of fair value information stems from the dissimilar economic functions played by financial and operating assets in the value generation process, which causes investors to have differential information needs with regard to these assets. There are two implications from this. Firstly, as a means to summarize business transactions and report information for economic decisions, the approach to accounting depends on economic activities; accounting should respond to the specific economic roles played by assets and liabilities in business operations. Secondly, for firms engaging in real (as opposed to financial) operations, fair value accounting does not fundamentally ease the valuation problem for investors. This is because the fair values of operating assets (primarily) represent the cost of

input for operations, whereas what investors ultimately need to figure out is the value generated by those operations.

The chapter also addresses other issues about financial reporting. Firstly, it establishes a theoretical underpinning for accounting income measures, namely, the notion of the value generated from economic activities as viewed from an investor's standpoint. This theoretical construct sets a benchmark for evaluating both the income measures adopted in practice and those being considered by standard setting bodies. Secondly, we explain that accounting gains or losses are not necessarily economic gains or losses for investors (albeit the two overlap to a large extent).

It should be noted, however, that the theoretical model developed here is limited by its simplifying assumptions, and many issues pertinent to a practical scenario have been excluded. One such issue is that in practice the separation between "financial" and "operating" assets is not always clear-cut. For example, when a firm holds an equity claim in another firm (which is a financial activity in itself) and the investment gives the (investing) firm a significant right of control over the issuing firm, the boundary between financial and operating activities becomes blurred. Nonetheless, the analysis in this chapter is one of the first to lay down a theoretical basis for addressing specific standard-setting issues in a valuation context. Further work along this line of analysis will be important to the development of a more comprehensive framework for examining various financial reporting issues.

References

Barth,M. E. (2004). Fair values and financial statement volatility. In C. Borio,W. C. Hunter, G. G. Kaufman, & K. Tsatsaronis (Eds.), The market discipline across countries and industries. 434 Cambridge, MA: MIT.

Barth, M. E. (2006a). Research standard setting and global financial reporting. Foundations and Trends® in Accounting, 1, 71–165.

Barth, M. E. (2006b). Including estimates of the future in today's financial statements. Accounting Horizons, 20(3), 271–285.

Benston, G. J. (2008). The shortcomings of fair-value accounting described in SFAS 157. Journal of Accounting and Public Policy, 27(2), 101–114.

Bleck, A., & Gao P. (2010). Where does the information in mark-to-market come from? (Working paper). Chicago, IL: University of Chicago.

Christensen, H., and V. Nikolaev. 2009. Who uses fair value accounting for non-financial assets after IFRS adoption? Working paper, University of Chicago.

Nissan, D., and S. Penman. The boundaries of fair value accounting. Working paper, Center for Excellence in Accounting and Security Research, Columbia University.

Dichev, I. D. (2008). On the balance sheet-based model of financial reporting. Accounting Horizons, 22(4), 453–470.

Feltham, G. A., & Ohlson, J. A. (1995). Valuation and clean surplus accounting for operating and financial activities. Contemporary Accounting Research, 11(2), 689–731.

Hicks, J. 1946. *Value and Capital*. 2nd ed. Oxford, UK: Clarendon Press.

International Accounting Standard Board and Financial Accounting Standard Board (IASB/ FASB). (2005a, June). Information for Observers. Joint International Group on Performance Reporting. IASB/FASB.

International Accounting Standard Board and Financial Accounting Standard Board (IASB/ FASB). (2005b, January). Information for Observers. Joint International Group on Performance Reporting. IASB/FASB.

International Accounting Standard Board and Financial Accounting Standard Board (IASB/ FASB). (2007, October). Information for Observers. IASB/FASB.

Johnson, T. L. (2005). Relevance and Reliability: The FASB report. Retrieved from http://www. fasb.org/articles&reports/relevance_and_reliability_tfr_feb_2005.pdf/

Lambert, R. (2010). Discussion of "implications for GAAP from an analysis of positive research in accounting. Journal of Accounting and Economics, 50(2–3), 287–295.

Lu, T., Sapra, H., & Subramanian, A. (2011). Agency conflicts, prudential regulation, and marking to market (Working paper). Chicago, IL: University of Chicago.

Schipper, K. (2005, August). Fair values in financial reporting. Presentation at American Accounting Association Meetings. Retrieved from http://www.fars.org/2005AAAFairValueKSchipper.pdf